



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,677	06/06/2005	Jorg Schulte	09086-00226-US	6849
23416 7590 03/06/2007 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			EXAMINER LEE, RIP A	
			ART UNIT 1713	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/06/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/537,677

Applicant(s)

SCHULTE ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,5-7,11 and 12 is/are allowed.
- 6) ☒ Claim(s) 3,4 and 9 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 06-06-05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because it is too lengthy. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 3, 4, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Küber *et al.* (U.S. 5,840,947).

Küber *et al.* teaches methods for preparing metallocene complexes by reaction of a dianion of a *bisindenyl* ligand with a transition metal compound, as shown in the reaction scheme in column 15. This synthetic procedure is unexceptional and well known to those of ordinary skill in the art. The variously substituted *bisindenyl* metallocenes may be prepared readily from the appropriately substituted ligand precursor, and steps to making said precursor are also outlined in the reaction scheme. One transition metal complex useful for practicing the invention of the prior art is 1,2-ethanediylbis(4-(2-pyridyl)-7-methylindenyl)zirconium dichloride<sup>†</sup> (col. 10, line 40) and 1,2-ethanediylbis(2-methyl-4-(2-pyridyl)-7-methylindenyl)zirconium dichloride<sup>‡</sup> (claim 9, col. 28, line 27). The reference does not show the neutral precursor ligand used to make this particular metallocene complex, however, it would have been obvious to one having ordinary skill in the art to follow the reaction scheme disclosed in the reference and make the neutral 1,2-ethanediylbis(4-(2-pyridyl)-7-methylindenyl) ligand precursor in order to make the corresponding metallocene. Such as process is well established and within the level of ordinary skill in the art, and since the metal complex is exemplified in Küber *et al.*, the corresponding neutral ligand set is also obvious over the prior art.

5. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach ligands having the substitution pattern recited in the instant claim.

---

<sup>†</sup> corresponds to R<sup>2</sup> being a heteroaromatic radical and R<sup>5</sup> being a C<sub>1</sub> radical

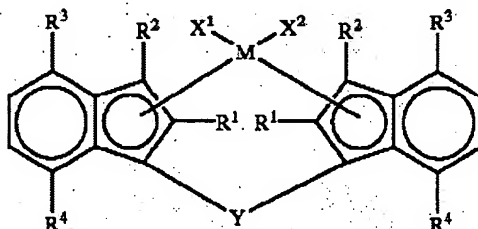
<sup>‡</sup> corresponds to R<sup>2</sup> being a heteroaromatic radical and R<sup>1</sup> and R<sup>5</sup> being a C<sub>1</sub> radical

***Allowable Subject Matter***

6. The following is a statement of reasons for the indication of allowable subject matter: Claims 1, 2, 5-7, 11, and 12 are allowed over the closest references cited below.

The present claims are drawn to an organometallic transition metal compound of formula (I); see claims for details. Salient features of the compound include:  $R^2$  is a (un)substituted  $C_6$ - $C_{40}$  aryl group,  $R^5$  is a  $C_1$ - $C_{20}$  alkyl radical, a  $C_2$ - $C_{20}$  alkenyl radical, or an arylalkyl radical.

Tanaka *et al.* (U.S. 6,686,055) teaches a transition metal compound represented by formula (I) reproduced below. Substituent  $R^3$  is a secondary or tertiary alkyl group of 3 to 20 carbon atoms or an aromatic group,  $R^4$  is hydrogen or an alkyl group of 1-20 carbon atoms, and Y is a divalent hydrocarbon group of 1-20 carbon atoms or a divalent silicon group.

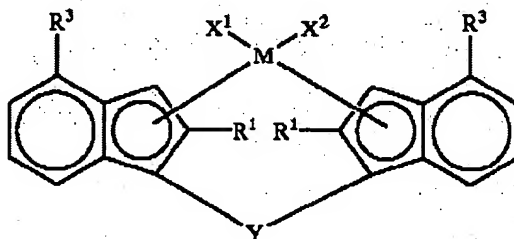


Representative compounds of formula (I) include the series,  $Me_2Si(2,7-Me_2-4-alkyl-indenyl)_2ZrCl_2$  where alkyl = Et, Bu, hexyl, cyclohexyl, phenylethyl ( $-CH_2CH_2Ph$ ), *i*-Pr, and *t*-Bu, corresponding to  $R^1$ ,  $R^3$ , and  $R^4$  being alkyl groups in formula (I). Note that only the compound where alkyl = phenylethyl satisfies the indenyl substitution pattern recited in the instant claims. The reference does not disclose an analogous series of compounds containing a  $-CH_2CH_2-$  bridge. Although use of such a bridging group is described in the generic description of compounds of formula (I), it is one of other possible bridging groups. In light of the disclosure showing that use of divalent silylene bridging groups is preferred (col. 9, lines 45-50), and in view of the fact that compounds exemplified all contain a  $Me_2Si$  bridging group, it would not have been obvious to one having ordinary skill in the art, absent motivation to do so, to

Art Unit: 1713

replace the exemplified compounds with a  $-\text{CH}_2\text{CH}_2-$  group and thereby arrive at the compound of the instant claims.

A subset of compounds in Tanaka *et al.* are those of general formula (Ia) represented by

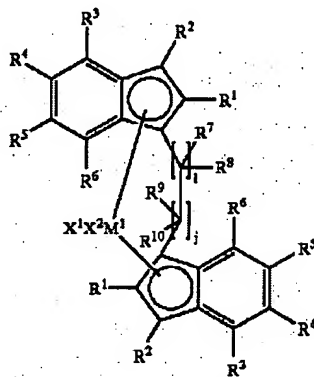


$\text{Me}_2\text{Si}(2\text{-methyl-4-Ar-indenyl})_2\text{ZrCl}_2$ . Note that when R<sup>3</sup> is an aromatic group, substituent R<sup>4</sup> is hydrogen. The reference does not teach compounds containing a substituent at the 7-position of the indenyl ring when R<sup>3</sup> is aryl, and one of ordinary skill in the art, absent any suggestion to do so, would not have found it obvious to modify the compound in order to arrive at the compounds of the instant claims.

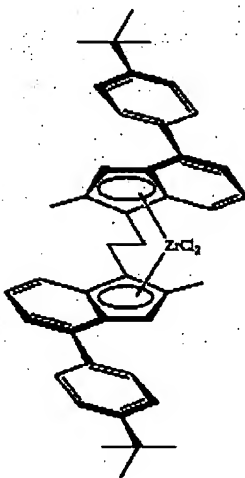
Bingel *et al.* (U.S. 6,492,539) discloses the metallocenes  $\text{Me}_2\text{Si}(2,7\text{-Me}_2\text{-4-PhInd})_2\text{ZrCl}_2$  and  $\text{Me}_2\text{Si}(2,7\text{-Me}_2\text{-4-naphthylInd})_2\text{ZrCl}_2$  (col. 53, lines 20 and 34). These two compounds are two of an extensive series of silylene bridged compounds, and there is no disclosure of corresponding alkylene bridged compounds. Absent any suggestion or motivation to do so, one having ordinary skill in the art would not have found it obvious to modify only these two compounds in order to arrive at the subject matter of the instant claims. The only series of alkylene bridged complexes immediately apparent in Bingel *et al.* contain the unexceptional 2-alkyl-4-aryl substitution pattern on the indenyl ligand (col. 44, line 29 – col. 45, line 15) and those containing a 4-aryl-6-alkyl substitution pattern (claim 10). Therefore, the reference does not teach or make obvious compounds containing the combination of elements recited in the instant claims.

Art Unit: 1713

Schulte *et al.* (U.S. 2003/0199703) teaches a series of metallocene having the general structure shown below. Substituent  $R^3$  is a (un)substituted  $C_6-C_{18}$  aryl group and  $R^1$ ,  $R^2$ ,  $R^4$ ,  $R^5$ , and  $R^6$  are identical or different and are each a hydrogen atom or a  $C_1-C_{20}$  group.



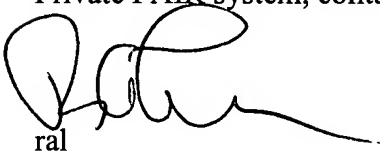
Representative compounds of the invention are those containing an ethylene bridge, an aryl group at the 4-position of the indenyl ligand and an alkyl substituent at the 2-position, as shown in example 6 (reproduced below). The reference does not teach metallocenes having the minimum 4-aryl-7-alkyl- substitution pattern recited in the instant claims.



Art Unit: 1713

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



ral

February 28, 2007